in others, they are smaller, deeper, and rounder; the ridges between these cells are formed of one or more convoluted capillaries, and this arrangement of capillaries is particularly evident in the rugæ. (See Fig. I.) The walls of these cells or pockets are formed of a network of capillaries, which subdivides each cell into smaller ones; these cells are what are ordinarily called the orifices of gastric glands, and the subdivision in the bottom of each cell corresponds with the described orifices of tubuli. In the antrum pylori, the structure is modified, the ridges between the cells become larger, more elevated, (See Fig. II.), and as we approach the pyloric orifice, *conical villi* make their appearance; these villi are more numerous and larger towards the pyloric valve, so that fewer of the angular or polygonal cells are visible in their interstices; they are not so large as the villi of the small intestine, but in other respects their external appearances are precisely similar. (See Fig. III.) When well injected, they seem to be composed of capillaries, closely united by a basement membrane, and forming a pyramidal projection.

There may be said to be three different appearances presented by the microscopic examination of the injected capillaries of the mucous membrane of the stomach when deprived of its epithelium. First. The convexity of a large ruga will have a comparatively smooth and even appearance formed by convoluted and intertwining capillaries. Second. Any other portion excepting the antrum will exhibit cells or alveoli of different sizes and shapes, separated by ridges of various thicknesses, and these ridges are composed of capillaries arranged in the same manner as in the rugæ. Third. In the antrum pylori there are *conical villi*, and cells exist in the interstices and at their bases.

That the main point which we wish to prove may be understood in a few words, we would simply state that we consider the capillaries arranged in the form of "ridges, cells, and *villi*." The question may now arise whether this description in any manner deviates from those ordinarily given in the standard works of the day? We consider that it does, particularly with reference to the villi, the existence of which, in the stomach, we wish fully to establish by description and demonstration. It might be asked whether the term *villous* has not constantly been used with reference to the mucous membrane of the stomach? Unquestionably it has, though in a vague and loose way, as indicating a smooth, velvety surface; but not as implying a vascular, papillary projection to which the term *villus* is applied in the intestine.

To corroborate the statement, that it is generally believed that villi do not exist in the stomach, we have only to refer to recent anatomical and physiological writers on the subject. Kirkes and Paget* teach us not only that there are no villi in a healthy stomach, but that the cellular and honeycomb appearance characterizes the whole of its mucous membrane, and that the appearance is *uniform*. Neither Wilson nor Todd and Bowman speak of villi in the stomach. Carpenter[*] refers to "pointed processes that have been *mistaken by some anatomists* for villi."

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* "Presents a peculiar honeycomb appearance produced by shallow polygonal depressions or cells. They are separated by highly elevated ridges, which sometimes, especially in *morbid states* of the stomach, bear minute narrow vascular processes, *that look like villi*, and have given rise to the *erroneous* supposition that the stomach has absorbing villi like those of the intestine. In the bottom of the cells are minute openings, &c., which are the orifices of perpendicular glands."—p. 165.

Hassall has neither drawing nor description of gastric villi in his Microscopic Anatomy.

Horner[†] says "that none exist in the stomach or colon."

Quain and Sharpey[‡] state "that these pointed processes may be compared to rudimentary villi, the perfect form of which only exists in the small intestine."

Harrison,[§] of the Dublin Dissector, denies the existence of true villi.

Hodgkin[‖] seems to be ignorant of this structure in the stomach.

Now these authorities are sufficiently numerous and authoritative to convince us that although the term *villous* has been used with reference to the stomach, yet the authors just quoted do not believe that *villi* exist in the stomach.

On the contrary, a number of other writers say that villi *do exist* in the stomach, and give descriptions of them, though none have made drawings of them but Berres,* whose magnificent work has fallen into my hands since the artist has given the accompanying representations. With the exception of Berres, we believe no one has had the knowledge of this structure, although Bèclard† says "the villosities are nowhere more numerous than in the pyloric half of the stomach and small intestine;" and again, in a succeeding paragraph, says, "they are shorter and *less numerous in the stomach* and large intestine," and in another denies the vascularity of them. If Bèclard's injections could not exhibit the vascularity of these villi, it is hardly probable that he could have any accurate idea of the structure, for it is only by successfully executed injections that the true form of the villi can be determined. An opinion founded on no better data can hardly be more than an hypothesis, or an inference from the nature of the surface in other portions of the alimentary canal.

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[*] "These pits are more or less circular in form, and are separated from one another by partition—like elevations of the membrane which vary in depth; and sometimes even by pointed processes *that have been mistaken by some anatomists for villi.*"—p. 659.

[†] "The mucous coat of the alimentary canal in a healthy state, and successfully injected, appears to consist almost entirely of a cribriform intertexture of veins." "In the whole length of the intestine there is, however, every variety of shape of villi, from oblong, curved and serpentine ridges, to the laterally flattened cone standing on its base, &c. Conformably to this definition of villi, none exist either in the stomach or colon."—Vol. ii. p. 54.

[‡] "It is seen to be marked throughout, but more plainly towards the pyloric extremity, with little depressions or cells, named alveoli, which have a polygonal form." "The margins of these alveoli are elevated into pointed processes, which may be compared to *rudimentary villi;* the perfect form of these appendages only existing in the small intestine, and making their appearance in the duodenum."—Part III. p. 1025.

[§] "Numerous follicular papillæ, but not true villi, project, and leave between them small depressions or pits studded with minute holes; these pits are more or less circular, and are bounded and separated by the follicular elevations; they are more distinct towards the pyloric portion of the stomach; four or five foramina are seen in each: these are the orifices of the small glands and ducts that elaborate the gastric fluid, the mucous being probably furnished by the follicles."—Vol. i. p. 244.

[‖] "In fact, the surface of the mucous membrane of the stomach is generally described as villous: and even Billard appears to agree with this description of it. I have at least a doubt respecting the accuracy of this statement. To me the surface of the stomach, when viewed under the circumstances which I have mentioned, appears to the naked eye by no means perfectly smooth, but of an indeterminate character, very difficult to describe." "Whilst in the *serous* membranes, the assistance of a powerful microscope enables us to distinguish delicate fibres intimately interlaced, when the *mucous* membrane of the stomach is thus examined, *I can only observe an amorphous semi-transparent* mass in which no structural texture can be distinguished."—Lect. xix. p. 270.

Such also may be considered the value of Bichat's‡ statement upon this point. He *reasons* that they exist there, because they do in other parts; his generalizations lead him to assert the existence of structures we fear he had never seen. He says "analogy indicates it," but "it is difficult to decide the question by ocular demonstration."

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* Anat. Microsc. Corp. Humani. Auct. Dr. Josepho Berres, Prof., &c. Vienna, 1837.

† "The villosities whose existence is very general, but which are nowhere more numerous, larger, or more apparent than in the pyloric half of the stomach, and in the small intestines, and especially in the commencement of that intestine, are eminences still finer than the papillæ."

"These villosities may with propriety be called the *radicals* of animals, are small foliaceous prolongations of the internal membrane," &c. "Were first described by Fallopius and Azelli, and have been figured by Helvetius, Lieberkuhn, Hedwig, Rudolphi, Meckel, Buerger, and others, especially in the small intestine, being shorter and less numerous in the stomach and large intestines."

"Those of the pyloric half of the stomach and duodenum are broader than long, and constitute a small lamina." "There is not perceived the vascular texture which has been described as belonging to them."—*Elem. Gen. Anat.*, Béclard, translated by Knox, 1830.

‡ The papilla of this system cannot be called in question at its origin, where it dips into the cavities, in the commencement even of these cavities, as upon the tongue, the palate, the internal part of the alæ of the nose, upon the glans penis, in the fossa navicularis, within the lips, &c. Inspection is sufficient to demonstrate them there. But it is asked if the papilla exist also in the deep-seated parts of this system. Analogy indicates it, since the sensibility is as great there as at their origin, though with varieties that we shall point out; but inspection proves it in a manner not less certain. I think the villi with which we everywhere see them covered are nothing but these papillæ. This manner of regarding them by explaining their existence generally observed upon all the mucous surfaces, appears to me to be much more conformable to the plan of nature, than to suppose them in each place with different and often opposite functions. Besides, it is difficult to decide the question by ocular observation. The delicacy of these elongations conceals their structure, even from our microscopical instruments—agents from which anatomy and physiology do not appear to me to have derived much assistance, because when we see obscurely, each sees in his own way and according to his own wishes. It is then the observation of vital properties that should especially guide us; now it is evident to judge by them, that the villi have the nature I have attributed to them."—*Bichat, Hayward's Translation*, 1822.

Billard, in his work on "Mucous Membranes," speaks of the stomach as possessing villi, and says, "they exist *generally* over its surface" (with which we cannot agree), although he describes them as "more numerous towards the pylorus," and that "in the healthy stomach the naked eye perceives them but indistinctly."

Huschke* seems to have appreciated the labors of Berres on this point, and admits that the pyloric portion contains villi: and Krause also speaks of "villous folds."

We thus see that even modern writers do not agree; and if this diversity of opinion exists at the present time amid the advantages which we possess, we should not be surprised at the conflicting testimony of those of older times.

Some expressions in Haller† might lead us to suppose that he had very clear evidence of the existence of villi, which he describes as "projecting into the cavity of the stomach;" he speaks also of "the inhaling veins opening in the pendulous villi."

Ruysch‡ gives a drawing from one of his minute injections, which exhibits

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[*] Mais les cloisons interposées entre les glandes tubuleuses méritent de fixer l'attention. Sur les dentelures qui servent de limite si tranchée entre l'épithélium de l'œsophage et le commencement de l'estomac, il-y a, suivant Berres, des papilles longues de 1-17 à 1-18 de ligne, sur 1-64 d'épaisseur, dans chacune desquelles pénètre une anse vasculaire de 1-139 de ligne. Ces papilles servent peut être à procurer une plus grande sensibilité aux points où elles existent. Dans le reste de l'estomac, les parois intermédiaires entre les orifices des glandes ne s'élèvent pas d'une manière notable, et l'estomac n'a point, par conséquent, des villosités proprement dites, quoique sa membrane muqueuse fasse le passage, par son aspect tomenteux, à celles qu'on nomme villeuses. Mais les choses changent lorsqu'on approche du pylore. Ici, non seulement le membrane muqueuse devient plus épaisse, mais encore sa surface acquiert rapidement une tout autre apparence, qui mène à la formation des villosités du duodénum. Voici comment j'ai trouvé la métamorphose. Les orifices des glandés tubuleuses s'élargissent rapidement, et leurs intervalles commencent à se soulever, deviennent par là mobiles et flottants, et acquièrent des bords en crête de coq, c'est-à-dire pourvus de pétites points à trois dents. Pendant que ces bords s'élèvent ainsi en manière de plis ou de lames que Krause nomme *plicæ villosæ*, et auxquels il assigne 1-28 à 1-19 de ligne de hauteur, sur 1-56 à 1-28 de large, le fond des glandules tubuleuses se rapproche aussi davantage de la surface, et leur cavité tout entière est alors devenue l'intervalle entre les villosités lamelleuses. D'abord leurs parois intermédiaires sont encore tubuleuses; mais quand l'ouverture des glandes s'agrandit, elles ne tardent pas à se recourber irrégulièrement sous des formes diverses, en zig-zag, en rond, en spirale, continuent d'abord de tenir les unes aux autres par des saillies plus ou moins prononcées, et finissent par perdre entièrement ces moyens d'union; de sorte qu'alors les glandules tubuleuses se continuent les unes avec les autres à la surface, et ressemblent plus à un labyrinthe qu'à un rayon de miel ou à un réseau.—*Encyclop. Anat. Traité de Splanchnologie*, par E. Huschke. Paris, 1845.

[†] Haller's Physiology, vol. ii. p. 161. Lond. 1754.

[‡] "Quando enim ventriculi arterias cera replevi rubrâ: posteaque in liquore idoneo ita

the surface of the stomach as consisting of regularly-formed pockets or cells. He speaks also of villi, but nevertheless confesses that his view of this arrangement was only particularly satisfactory in sheep. If he had satisfactorily injected the villi of the stomach, is it not probable that he would have given us a drawing of this structure in his work?

Fordyce says "that as far as I can judge, it seems to be nothing but cellular membrane. When the surface was moderately moist, there seemed to be a number of thin fine membranes crossing each other, so as to form a number of angular cells."

Hewson states that the whole surface of the intestinal tube is covered with villosities, but admits that in the large intestine these bodies are so short, that the surface appears smooth to the naked eye, while no true villi are detected by the microscope; only the partitions between the cells resemble villi in their structure. In the stomach a nearly identical appearance is found. "At the upper part of this organ, the villous coat appears in a microscope like a honeycomb, or like the second stomach of ruminating animals in miniature; that is, full of small cells, which have thin membranous partitions. Towards the pylorus these partitions are lengthened, so as to approach to the shape of the villi in the jejunum."*

That these opinions should have but little weight with writers and teachers at the present day, and that they should be quoted merely as elucidating the history or the literature of the subject, ought not to surprise us, when we learn that their descriptions were generally based upon observations made with the naked eye, or with instruments in which the observers had but little confidence; for both Fordyce and Bichat, although they used microscopes, expressed themselves as deriving no advantage from them. Neither are we disappointed at the want of accuracy in their descriptions, when we reflect that their comparisons were derived in a great measure from the inspection of inferior animals, and that the meaning attached to such terms as cells, alveoli, crypts, pockets, lacuna, glands, villi, papillæ, &c., is conventional, and varies

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prius præparatas partes hasce macero, experior tum superficiem interiorem ventriculi et intestini jejuni tunicâ quasi quadam papillosa vestitam esse. Fateri tamen debeo, haud ita evidenter quidem in stomacho humano has papillas apparere, ut quidem in ovillo: quemadmodum hâc in figurâ expressi. Inde itaque et tanto facilius inducimur credere, et in homine ita obtinere, quum obscurius quidem similitudo accedens in homine observetur."—*Ruysch, Dec. Tert.*, p. 34 and 35, 1737.

"Voco autem hanc intestinorum tunicam villo-papillosam, quia animadverti villosam istam superficiem penitus simul esse papillosam, quemadmodum se habent interiora nostrarum Genarum in suo integumento, ut et labia oris, œsophagus, ventriculus, omniaque intestina, quum sit in his omnibus ejusdem apparatus continuata productio. Verum quidem est, in unoquoque non æque clarum id apparere; quum in Labiis genis internis, et in intestinis multorum hominum tunica hæc papillas hasce nimis manifestas non possideat, attamen in aliis satis conspicua datur."—*Ruysch, Dec. Secunda*, p. 25 and 26.

* Dr. Sprott Boyd's article on the Structure of the Mucous Membrane of the Stomach. *Edin. Med. and Surg. Journal*, 1836.

with the different periods at which the authors above referred to have made public the results of their observations.

We ought next to inquire what is taught by the principal physiological writers of the day upon this subject, and examine the evidence upon which they base their theories, and see how far the structure they demonstrate corresponds with what we may conceive to exist.

The investigations most frequently referred to are those of Sir E. Home and Dr. Sprott Boyd, although the diagrams of Ruysch, Horner, Todd and Bowman, and Berres are far more in accordance with nature. We refer now merely to the mucous membrane, and not to its epithelial investment, which has received so much attention from Wassman, Henle, Wagner, Hassall, and others.

Sir E. Home says: "The structure upon the upper arch of the stomach which when magnified by a common lens had the appearance of glands, is shown by Mr. Bauer to be made up of cells in the form of a honeycomb; this honeycomb structure consists of cells of the greatest depth in this particular situation, but over the whole surface of the cardiac portion of the stomach the appearance is so faint as to require a great magnifying power to render it visible. In the pyloric portion the cells in general have the same appearance, but there are small clusters, the sides of which rise above the surface, giving the appearance of foliated membranes."

And Dr. Sprott Boyd agrees with him, for he says "the appearance of those cells, throughout the cardiac portion of the stomach, corresponds to the representation given of them by Sir E. Home. When the mucous membrane is extended, they appear tolerably regular both in form and size, varying from the one-two hundredth to one-three hundred and fiftieth of an inch in diameter, being smaller in the young man than in the adult subject. Towards the pylorus, the mucous membrane, which is thin throughout the great cul-de-sac of the stomach, becomes considerably thicker, the dimensions of the cells are increased, and an appearance somewhat resembling that described by Sir E. Home is perceptible. He mentions the patches distinguished by the foliated membranes as existing particularly towards the pylorus. They may be found, however, in the cardiac portion of the stomach likewise; perhaps not actually at the great extremity; but certainly opposite the termination of the œsophagus. In the engraving given by Home of these patches, the wall of each cell is represented as rising above the general surface of the stomach, and being cleft into a number, ten or a dozen, of rounded segments, which form a complete fringe about the mouth of the cell. These projections of the mucous membrane are, so far as I have been able to observe, much less numerous. There is no regular fringe, but here and there a prolongation of membrane, resembling an ordinary villus of the intestine, rises from a partition between two cells. These bodies from their small size are not easily distinguished; they give to the surface a more flocculent and velvety appearance than is presented by other parts of the stomach. The cells near the pylorus are in some cases about one one-hundredth of an inch in diameter, and on examining them on a dark ground, and with the aid of a reflector and a magnifier of a quarter of an inch focus, their interior is pretty distinctly seen presenting an appearance similar to what I have presently to describe as existing in the stomach of the pig, where it is more clearly visible and more easily examined. The floor of each cell appears perforated by numerous circular openings, as if a number of tubes opened on it; and on making a vertical section of the mucous membrane, it is seen to be composed of striæ or fibres running perpendicularly from the free surface of the membrane to the cellular coat beneath."

The diagram of Dr. Boyd is the one which is usually copied into the text books of the day. Had it been made from an injected preparation, we think the nature of "cells and the circular openings perforating their floor" would have been more distinctly demonstrated. The circular openings which he considers to be the orifices of *tubule*, which he describes partly from observation, and partly from analogy in the pig's stomach, we consider to be simply the subdivisions of the cells into smaller and deeper ones by the arrangement of the blood-vessels. We have no disposition to make any innovations upon the terms "tubuli," "gastric tubes," "pyloric tubes," &c., but merely wish to show that their parietes are formed of vessels, and that they are elongated cells or alveoli.

It will be a question of great interest to determine the uses of the *Gastric Villi.* Their form and structure, and their resemblance to the intestinal villi would naturally lead us to associate them with the function of absorption, although some, perhaps, who still consider the intestinal villi to be tactile, would wish to ascribe the same character to those of the stomach. We would not imply by the application of this term *villi* that their uses are precisely similar to the villi of the intestine, that is, that they participate in the chyliferous absorption, or that their lymphatics should be called lacteals; on the contrary, we would believe that the fluid which they absorb is very different from that which has to be subjected to the influence of the bile and pancreatic juice previously to its removal from the intestine; for we have neither mesentery attached to the stomach, nor mesenteric glands for lacteals to pass through, did we suppose them originating in the villi of the pylorus. But is there no other absorption from the stomach than that of watery fluids by endosmotic action directly through the parietes of the blood-vessels? May not these villi be the special apparatus for the absorption of the solution of the albuminose compounds? Is there no nutrition except through the villi of the intestine?

EXPLANATION OF THE PLATE.

Fig. 1 exhibits the gastric cells and capillary ridges.

Fig. 2 exhibits the cells becoming deeper and the ridges becoming more elevated and pointed.

Fig. 3 exhibits the *Gastric villi*, together with gastric cells.

Fig. I.

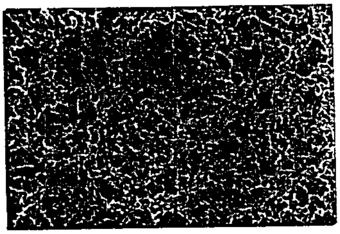


Fig. II.

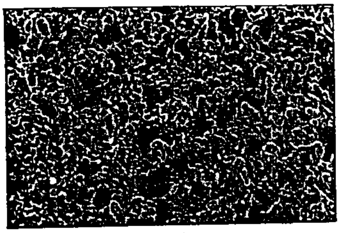
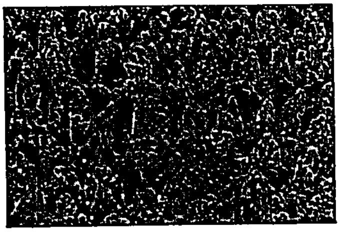


Fig. III.



[illegible] Philad.

ART. II.—*Notes of cases of Phthisis Pulmonalis treated in the Pennsylvania Hospital; with remarks on Cod-Liver Oil and its uses in Tubercular Disease.*

By JAMES J. LEVICK, M. D., Resident Physician, Pennsylvania Hospital.

DURING the winter, spring, and the early part of the summer of this year, the medical wards of the Pennsylvania Hospital, under the care successively of Drs. Wood, Pepper and Gerhard, attending physicians, have presented a large number of interesting cases of disease. An opportunity has thus been afforded the writer, as resident physician, of noting the progress and results of these cases. From these notes, the following reports have been taken, and are now offered for publication in the hope that they may do their part towards determining the remedial value of cod-liver oil.

Although this motive has led to their publication, it was but a subordinate consideration at the time they were recorded; but to modify the history of the patient, the notice of the symptoms, and the results of the inspections, so as to have this always the prominent object, would require more time than the writer at present has at his disposal; and the reports have therefore been given almost exactly as they were made at the time, after the close of each day's duties in the wards. Where the previous history of the case has been given, it has been in very nearly the words of the patient himself, the person and tense having alone, for the most part, been changed.

CASE I.—A German, surgical instrument maker, æt. 47, dark hair, of medium height, was admitted into the hospital November 7, 1849, for chronic rheumatism. The patient was evidently of a scrofulous diathesis; had on each wrist a bursal tumour filled with cheesy substance. Had cough, with puriform expectoration.

Upon examining his chest, a small cavity was detected at the summit of the left lung. He was at once placed on the use of cod-liver oil, tablespoonful thrice daily; and iodide of potassium gr. xv daily—to have No. 4* diet, and milk and an egg in the morning. He remained in the house for sixteen weeks, and was then discharged, having gained several pounds in weight, and having a very decided diminution of his cough—the physical signs undergoing little or no change.

CASE II.—A seaman, æt. 20, with light hair, a little below the medium height, was admitted September 22, 1849, much emaciated, with cough, copious

* The following is the diet table of the hospital numerically arranged:—

No. 1. Barley water, gruel, arrowroot, sago, tapioca, rice water.
No. 2. Gruel, tea, bread, rice, molasses, mush, vegetables.
No. 3. Bread, tea, rice, molasses, mush, vegetables, soup.
No. 4. Bread, tea, chocolate, vegetables, soup, meat.

purulent expectoration, and with the physical signs of a cavity at the summit of each lung. With this patient there was great intolerance of cod-liver oil, so that after attempting its use for several days it was omitted. He resumed the oil November 16, and continued to take it until his death. After five weeks' use of the remedy there appeared to be an arrest in the progress of the disease. There was, however, no permanent improvement, and the man died four months after his admission, and after an illness of two years.

An inspection showed the existence of a cavity larger than a walnut at the summit of each lung; and numerous larger and smaller tubercles in the stage of softening scattered through the lungs.

Case III.—A seaman, æt. 21, admitted October 13, 1849. Had had cough for eight weeks—before this time had had pleurisy of the left side coming on after exposure to cold and wet. Had suffered for a long time from pain in the bowels and from diarrhœa. He was at once placed on the use of cod-liver oil f℥ss ter die, and liq. morph. sulphat. fʒi ter die.

I found him in the early part of December considerably emaciated, harassed by cough, and expectorating nearly ten ounces of pus daily; with cavernous respiration, pectoriloquy and gurgling below the left clavicle, and gurgling below the right clavicle. In addition to the pulmonary affection, there was obstinate abdominal pain and diarrhœa.

Notwithstanding this condition of his bowels, the patient increased in weight, his appetite improved, and he was able to walk about the house, feeling better than at the time of his admission into the hospital. Thinking it possible that the diarrhœa might be aggravated by the use of the oil, Dr. Wood directed its omission for a short time. For a day or two following, the diarrhœa diminished; it soon returned with its former frequency; the use of the oil was resumed, but the patient had acquired a dislike to it, and it was taken with difficulty and irregularly. The cough, expectoration and diarrhœa increased, and the man died February 28, 1850.

On inspection, there was found considerable serous effusion in the left pleura; a vomica at the summit of each lung—that of the right side (the larger of the two) about the size of a hen's egg, and traversed by a band enclosing a vessel through which a fine probe was readily passed. The mesenteric glands were found tubercular; numerous small tubercles dotted the peritoneal surface of the intestine, the mucous membrane of which was found extensively ulcerated.

Case IV.—A shoemaker, æt. 24, born in Ireland, rather above the medium height, was admitted September 8, 1849. Had been well until the first of May preceding—was at that time on a frolic and took cold. From this time had had a cough, which had continued steadily to increase. Had rapidly lost flesh, but had had no hæmoptysis.

At the time of his admission the patient was very feeble, much emaciated, unable to leave his bed; with frequent cough, rigors and hectic. Percussion dull at the summit of left lung, clear elsewhere; cavernous respiration and subcrepitant râle distinctly heard below the left clavicle. On the 10th, was ordered cod-liver oil, tablespoonful thrice daily—with occasional anodynes; No. 3 diet; increased two days later to No. 4.

30*th.* Had a slight hemorrhage. ℞.—Acid sulph. aromat. gtt. x t. d.; a small blister to be applied below the clavicle. These symptoms steadily continued during the first six weeks of his residence here. At the end of this time, an improvement of his appetite and with it an increase of strength began to be noticed; this was followed by a gain of flesh. Two weeks later he was able to leave his bed, though still coughing and expectorating considerably.

A gradual though somewhat variable improvement followed. He remained in the hospital about six months, steadily using the oil in the dose before mentioned. At the expiration of this time, an entire amelioration of his symptoms had taken place. He was discharged March 15, 1850, being at the time the stoutest patient in the medical ward, having scarcely any cough, no expectoration, no hectic, with his appetite and strength as good as they ever were. The physical signs at this time were obscure dulness below the left clavicle, with rude respiration at the summit of the left lung.

Case V.—Of this case I have but very imperfect notes. He was a seaman, aged forty years, who entered the hospital Sept. 10th, 1849, far advanced in consumption, with pectoriloquy, gurgling, and cavernous respiration below each clavicle. He was at once placed on the use of cod-liver oil, tablespoonful thrice daily, and a teaspoonful solution of sulphate of morphia, *pro re nata.* He continued the use of these remedies until he was discharged from the house. After a time there appeared to be a very slight improvement in his condition, but this, if real, continued for but a very limited period. He was removed at his own request, February 20th, 1850, with but little hope of surviving many weeks.

Case VI.—A seaman, aged twenty-seven years, born in Prince Edward's Island, dark hair, with numerous scrofulous abscesses of neck and throat, was admitted December 21st, 1849. Five years before had a cough which lasted for two months, and was the result of exposure on the coast of England after a wreck. With this exception had had good health until March 1st, 1849. At that time had swelling of the glands of the neck and under the jaw. This continued to increase for some months, and then disappeared. Two months later reappeared, and with a cough had continued since. Was treated in the Rio Janeiro Hospital for these abscesses, remaining there for five weeks, during which time he had an attack of erysipelas; was very feeble when he left. Had never had hæmoptysis. Did not expectorate to any amount until five months before his admission, when (to use his own words) something like a boil broke in his chest, and a most abundant discharge of matter followed. Was relieved by this. Has had little or no nausea. Bowels pretty regular.

At the time of his admission was extremely ill. Countenance anxious, very feeble and emaciated, harassed by cough, and expectorating twelve ounces of pus daily. Auscultation loud; cavernous respiration, pectoriloquy and mucous gurgling after coughing, at the summit of the left lung. Cavernous respiration, slight gurgling and imperfect pectoriloquy below right clavicle. On the 28th, he was ordered cod-liver oil (with a bottle of porter daily), in the usual dose; an anodyne at night and *pro re nata,* No. 4 diet and a mutton chop daily.

January 8*th.* ℞. Infus. prun. Virginian. f℥ij t. d., and to have milk and crackers.—29*th.* Complains of great nausea and inability to take the oil; to be omitted for a few days.

February 3*d.* Resumed the use of the oil.—22*d.* Had a slight attack of diarrhœa, checked by an opiate.

At this time a very marked improvement in the appearance of the patient had taken place. He had lost his anxious expression of countenance, several of the scrofulous abscesses had healed, and there had been a very decided increase of his weight and strength; his appetite was good, and he was seldom in bed.

March 31*st.* The tonsils very much enlarged, almost preventing deglutition. To be touched with solution of nitrate of silver ʒss to ℥j. *April* 2*d.* Throat much better. 10*th.* Very great quantity of puriform expectoration, amounting to nearly a pint. 28*th.* Had an attack of hæmoptysis. To correct this, ℞. Acid. sulph. gtt. x t. d.

May 14*th.* On a close examination of his chest to-day, I find the physical signs below the clavicle to be very much as at the time of the man's admission. At the lower part of the right thorax anteriorly there is complete flatness on percussion extending above the sixth rib, with great prominence of this part of the chest. Posteriorly on the same side, a little below the inferior angle of the scapula, there is loud amphoric respiration.

July 4*th.* Has complained of pain at the lower part of his right side, relieved by a blister.

Notwithstanding these evidences of an increase of the disease of the lungs, the improvement in his general health, as shown by increased weight and strength, continued, and the patient, with the infatuation of his disease, believed himself to be fast getting well. 20*th.* Had a bad attack of diarrhœa, checked by anodyne enemata. 29*th.* Diarrhœa returned; considerable discharge of blood from the bowels. ℞. Opii pulv. gr. ss q. q. h. Has much nausea and vomiting with total inability to retain the oil. Pulse very feeble. ℞. Vini rubr. f℥vi daily. This bowel complaint continued with increased violence, resisting all treatment, the number of discharges amounting to sixty daily. Under the exhausting effect of these the patient rapidly sank, and died August 27, 1850. The inspection was made twenty-four hours after death, with the following results:—

Exterior.—Emaciation moderate; numerous cicatrices of old abscesses on neck and throat.

Thorax.—Slight adhesions of left pleura; adherent in the whole extent of right side. Third rib carious, and pieces of it torn away in removing the lung. A large cavity found at the summit of each lung. A little below and exterior to the root of the right lung there was a cavity larger than a hen's egg; a smaller one was found a short distance below this. A small cavity was found near the centre of the left lung; numerous larger and smaller tubercles diffused through each lung.

Abdomen.—The liver was enormously enlarged, to nearly three times its natural size. The gall-bladder adherent to the intestine. A larger and smaller spleen. Several large ulcerations found in the great intestine. Tubercular deposits in Peyer's glands. The mesenteric glands much diseased, and containing numerous tubercular deposits. The inner surface of the sigmoid flexure appeared to be a continuous ulcer. No further examination was made.

Case VII.—A wool-sorter, æt. thirty-two, born in Wales, with light hair and fair complexion, was admitted February 9th, 1850. Had been in good health until the preceding September. Had been exposed to the damp and cold while working in a new building, the windows being unglazed. First had cough, followed by chills and sweats; had had no hæmoptysis. At the time of his admission had dulness at the summit of right lung, loud bronchial respiration below the right clavicle and slight subcrepitant râle below the left; much emaciated, great anxiety of countenance, and expectorating about four ounces of muco-purulent matter daily; bowels constipated. 10*th.* Ordered of solution of sulphate of morphia f℥j ter die; cod-liver oil f℥ss thrice daily; to take an occasional cathartic. Diet No. 3, to be gradually increased.

March 13*th.* Had been pretty comfortable during the last three weeks. Thinks he took cold two days ago, since which time he has had severe pain in the lower part of his right lung. For this was dry-cupped. To-day has purulent expectoration (about ten ounces), which, he says, seems to come from the lower part of his lungs. On a close examination of his chest to day, I find, besides the signs noted before, amphoric respiration with metallic tinkling two inches below the left nipple. 17*th.* Pulse frequent and feeble, much dyspnœa. ℞. Vini alb. f℥vi daily.

This debility and dyspnœa continued for several days; added to which were the continuance of copious purulent expectoration and increasing evidences of pneumothorax, the latter being followed by a slight attack of pleurisy.

April 5*th.* Feels better to-day than he has done for a long time. Has (notwithstanding this) very violent action of the heart, and an unusually anxious countenance. Gurgling distinctly heard below the inferior angle of the left scapula. In very much this condition the patient remained until April 29th, using the remedies above mentioned. That an increase of the local disease took place there was no doubt. I could not observe any decided improvement in his general appearance, though the man was very positive such was the case, feeling, he said, much brighter and stronger than he was at the time of his admission. Contrary to our judgment he determined to return to Wales, and was discharged at his request for that purpose April 29th, 1850.

Case VIII.—A seaman, æt. thirty-eight, born in United States, dark hair, sallow complexion. This patient entered the hospital September 25th, 1850, with pneumonia of the right lung slightly involving the left lung. He was too ill at the time of his admission to give any account of himself; the following was subsequently learned. That during the last year he had always had a cough after the slightest exposure to cold. Had never had hæmoptysis: did not know that any of his family had had consumption, but recollected that his father had a cough for a long time; had been in the habit of drinking freely. Had attended to his work until a week before his admission. At that time had a chill followed by fever, &c. Had had more or less pain in his liver for nearly five years; had an attack of pleurisy many years ago. At the time of his admission was suffering much from partial dyspnœa, pulse frequent and feeble. There was no reason to suspect the existence of tubercles, the patient having all the signs of pneumonia in its second stage. Percussion dull on the right side posteriorly; tubal respiration and crepitant râle. Expectoration rusty and tenacious; no delirium; countenance expressive of great distress.

The application of a few cups to the back of the chest followed on the succeeding day by a blister was the only depletion resorted to, the patient's asthenic condition forbidding any more active treatment. For two days he used small portions of calomel and opium; it was soon found necessary to omit these and to substitute ammoniæ carb. gr. iij; senegæ syr. f℥ss q. t. h.; brandy punch tablespoonful every hour. Good diet.

Under this treatment the urgent signs of the disease abated and the patient though very feeble, was deemed convalescent.

March 17*th*. Pulse rather more feeble; has no appetite; coughs very much, and expectorates largely (nearly twelve ounces) of muco-purulent matter. ℞. Tr. cinchon. comp. f℥j, *q. q. h.* To have a bottle of porter, oysters, eggs and chicken. 18*th*. Much more comfortable. 19*th*. Very much troubled by diarrhœa. Ordered an enema of sixty drops of laudanum. 21*st*. Crepitant râle still heard though coarser. While ausculting this morning, thought I could hear indistinct gurgling, about two inches below the inferior angle of the scapula, as if there might be a deep-seated abscess of the lung, corresponding with that point. Cough troublesome; uses solution of sulphate of morphia f℥j at night. Has less bowel complaint. 23*d*. Diarrhœa has returned; omit the syrup of senega, which with the carbonate of ammonia he has continued to take occasionally. 31*st*. Very much jaundiced this morning: no other change.

April 11*th*.—Sat up to-day; vesicular murmur more distinctly heard to-day than at any previous time since his admission. The marked evidences of disease at the lower and posterior part of the lung had led us to neglect a close observation of its upper portion. On a closer examination of this at this time, there was found comparatively healthy respiration at the summit of the left lung, but, on the right side dulness on percussion extending from the clavicle to the third rib; cavernous respiration and gurgling below the right clavicle. Cough very troublesome, expectorates large quantities of puriform matter. ℞. Ol. jecoris aselli f℥ss ter die. ℞. Potass iodid. gr. v ter die.

24th. Has had several attacks of diarrhœa. Thinking this might be increased by the oil, it was omitted, and a mixture of chalk and kino ordered, which has diminished though it has not entirely checked the bowel complaint.

May 11th. Debility increased; has resumed the use of the oil, omitting it when there has been an increase of diarrhœa. Takes essence of beef in addition to his other remedies. *24th.* Pulse and voice very feeble. To-day has rude respiration at the summit of the left lung posteriorly, sub-crepitant râle, and loud bronchophony at lower part of right lung posteriorly; with the signs before noted. Has been obliged to omit the oil on account of a threatened attack of diarrhœa. Complains very much of his throat, which he says feels entirely raw—for this is using alum and conserve of roses. *31st.* Has continued to grow weaker, and died to day at 8 o'clock P. M. The autopsy was made twelve hours after death.

Exterior.—Rigidity incomplete, emaciation extreme, a large cicatrix on the left leg, the remains of an old ulcer.

Neck.—Larynx and trachea tuberculous and ulcerated in their whole length. Posterior portion most affected: this ulceration appeared to extend for a short distance into the right bronchus.

Thorax.—Firm pleuritic adhesion; pleura thickened and studded with numerous small tubercles. Summit of the left lung indurated with tubercles. Tubercles scattered throughout the lung. Along the outer side of this lung were found myriads of minute tubercles resembling the roe of fish in their number and arrangement. Bronchial glands near the root of the lung very much enlarged and containing a cheesy substance. The two lobes adherent; base of the lung adherent to the diaphragm. The right lung at its summit adherent to the chest; immediately below this a vomica as large as a duck's egg. Crossing this cavity were several bands, which seem to be the remains of vessels, the surrounding tissue having been destroyed. About an inch and a half above the base of the lung was found a large abscess, deeply-seated and full of most fetid pus. Numerous tubercles in its vicinity. Pleural surface of the pericardium thickened, adherent to the left lung, requiring dissection to separate it. On its internal surface it was firmly adherent to the heart by a false membrane about a line in thickness. When separated, this presented a beautifully tufted or papillary appearance, closely resembling the tongue of a bullock. The membrane having been closely examined, was found covered with minute tubercles. The size of the heart natural or nearly so; flaccid; a slight coagulum in the right ventricle; the cardiac valves, and the aorta and its valves healthy.

Abdomen.—Liver usual size, of a pinkish hue externally. Its surface corrugated as if by cicatrices; these did not extend into the substance of the gland; this appeared to be healthy. Gall-bladder nearly full of bile. At the apex of the gall-bladder on its external surface a small tubercle existed. Spleen natural size, its exterior surface white from old exudation. Throughout this viscus were found small white round depositions of a bony hardness, about the size of a pin's head. These might perhaps be called bony tubercles, but from their consistence and the integrity of the tissue in their immediate vicinity could scarcely be considered identical in character with those found elsewhere. Stomach, inner surface softened, and of a variable red colour; miliary tubercles found on its greater curvature, and covering both the large and small intestines. Numerous ulcerations apparently of tubercular origin in both large and small intestines. Mesenteric glands enlarged, and containing tuberculous matter. A few, though not all of them, in the softening stage. Left kidney contained one tubercle; right kidney healthy. The ureters and bladder were not closely examined.

Case IX.—A shoemaker, æt. 50, born in Ireland, married, of sober habits, was admitted February 13, 1850. Seven years before had influenza, since which time he had always had cough in the morning; though not amounting to anything serious. Gave up work in the early part of August 1849, on account of a shortness of breath and oppression about the chest, which he attributed to exposure to wet while working in a dye-house. After this, went to the sea-side, where he became much worse. From this time his cough increased, with expectoration, amounting to nearly half a pint of matter mixed with blood, daily; suffered much from exhausting night sweats. Had been much troubled with costiveness, sour stomach and want of appetite.

At the time of his admission, in addition to his dyspeptic symptoms he had a pale and anxious countenance, was harassed by cough and copious night sweats, followed by hectic fever and accompanied with entire inability to sleep. The physical signs were, loud amphoric respiration below the right clavicle with occasional mucous gurgling; bronchial respiration at summit of left lung posteriorly, with faint crackling. Percussion obscurely dull below the left clavicle, very marked *bruit de pot fêlé* a slight distance below the right clavicle; copious purulent expectoration. The evidences thus afforded of an enormous cavity were very decisive. He was ordered to take cod-liver oil in the usual dose, and a cough mixture, each dose containing equal parts of solution of sulphate of morphia and of syrup of senega four times daily. To have milk and No. 4 diet.

These symptoms continued, with but little amelioration, for nearly five weeks; at the end of which time my attention was called by both nurse and patient to his improved appetite, and on my own part to the absence of the anxiety of countenance with which the man entered the hospital. This was gradually followed by a diminution of cough and of expectoration, by marked increase of flesh and strength and by the entire disappearance of hectic.

He remained in the house until May 20, 1850, fourteen weeks; and was discharged at his own request, to return to his work, believing himself to be perfectly well: the physical signs having undergone no other change than the disappearance of a mucous râle which had been occasionally heard below the right clavicle. For many weeks before his dismissal he had entirely ceased to complain of any dyspeptic symptom with the exception of occasional constipation.

September 25*th*. This man called at the hospital to day, looking even better than when he left us. He has continued to use the oil, and asserts that he is perfectly well. The amphoric respiration and *bruit de pot fêlé* still very marked.

Case X.—A seaman, æt. 22, born in United States, entered the hospital March 16, 1850; of medium height, light hair. Three years before, had a hemorrhage from the lungs, and lost about six ounces of pure fluid blood. Did not suffer any serious inconvenience from this. Had had a slight cough for nearly two years, but not sufficient to seriously annoy him, until about two months before his admission. Within the last two months had suffered much from cough and obstinate diarrhœa. Had been troubled with pain in the region of the kidneys for a long time. The bowel complaint commenced about two months before he came here. At first had three or four passages daily, subsequently the number was very much increased, occurring as often as every second hour. Had lost twenty-eight pounds in weight during the last four months. Both parents alive and well.

17*th*. Patient feeble, and much emaciated. Coarse mucous rales below the right clavicle, and crackling in left subclavicular region. Percussion dull or nearly so for two inches below the left clavicle. Expectoration very slight. Was ordered cod-liver oil, tablespoonful thrice daily, and, to quiet his cough, a mixture of sulphate of morphia and tolu.

Rest and the supine position were for a few days enjoined, and were followed by a diminution of his diarrhœa. On the 22d, there was a return of diarrhœa, and he had eight discharges. To correct this, acet. opii, gtt. v four times daily, were prescribed. 24*th*. Complains very much of pain in the abdomen and of sick stomach. Omit the morphia and tolu, and increase acet. opii to eight drops every third hour. 27*th*. Diarrhœa continues. ℞. Cupri. sulphat. gr.¼, opii pulv. gr.¼ 4 t. d. ℞. Acet. opii gtt. viij ter die. 28*th*. Diarrhœa diminished to once in twenty-four hours, but is nauseated after taking the pills, which are to be temporarily omitted. 30*th*. Very feeble. ℞. Vini rubr. f℥vj daily; two passages to-day. 31*st*. ℞. Bismuth subnit. gr. x ter die.

April 1*st*. Four passages in last twenty-four hours. ℞. Bismuth subnit. gr. xx 4 t. d.

5*th*. Cough very troublesome; is unable to sleep after 2 o'clock A. M. without an additional opiate. Has an occasional anodyne enema. The oil has now been omitted for a few days; finding no diminution in the number of discharges, its use is to-day resumed. *14th.* For a few days has had four discharges daily; pulse very feeble, but as from the beginning has very little expectoration. *30th.* Very feeble, and becoming daily more emaciated; bowels moved three times daily. His debility rapidly increased, and the man died, May 2d, 1850. The autopsy was made twenty-four hours after death, with the following results.

Exterior.—Emaciation extreme.

Thorax.—Old pleuritic adhesions; a small cavity at the summit of each lung; left lung adherent at its summit to the rib, torn by its removal from the thorax. Other parts of the lung found to contain numerous small miliary tubercles.

Abdomen.—Liver healthy, gall-bladder empty. Spleen usual size but soft. Abdominal peritoneum healthy; intestinal peritoneum covered with tubercles of all sizes, and almost innumerable. Mesenteric glands enlarged and tuberculous. Intestines both large and small containing numerous ulcerations apparently of tubercular origin. One tubercle found in the right kidney.

Case XI.—A carver and gilder, æt. 19, medium height, light hair, delicate complexion, born in Ireland, was admitted March 9th, 1850. When a lad, had a swelling of the submaxilliary glands; with this exception had had good health until August 1849. First had cough and sweats during the night; had had but little expectoration. Bowels regular for the most part, though a little inclining to costiveness. Six weeks before his admission, had a very slight hæmoptysis coming on after a violent attack of coughing. Was not aware that any of his relations had had consumption; attributed his illness to sudden exposure to cold after working in a hot room. Did not give up work until four weeks before he came here.

At the time of his admission, emaciation considerable, but by no means extreme, great lividity of fingers; rigors and hectic daily. Sub-crepitant râle under left clavicle, with circumscribed dulness at the summit of left lung. On the 10th was ordered cod-liver oil, tablespoonful three times daily. Pil. ferri. carb. gr. v. ter die. No. 4 diet.

This patient remained in the hospital four weeks without any improvement in his condition, while he continued to suffer from increased rigors and hectic. About six weeks after his admission there appeared to be a slight improvement in his appetite and strength. The following note was taken › *April 25th.* Distinct crackling heard under each clavicle after coughing, loud bronchial (almost cavernous) respiration below the right clavicle.

May 14th. During the last fortnight, has complained very much of pain in the abdomen and of bowel complaint; this last has been checked by anodyne enemata.

At this time, a very marked change had taken place in the appearance and condition of the patient. He was discharged at his own request, to go in the country, May 18th, 1850; having gained greatly in flesh and strength, weighing within a pound of his weight previous to the commencement of his illness. His master, who had not seen him since his admission until this time, was very much surprised at his improved appearance. Notwithstanding this unequivocal improvement in the general symptoms, there has been a steady increase of the local disease as shown by the physical signs.

Oct. 1st. Have to day heard of this patient. He continued to improve for about two months after his dismissal from the hospital. Used the oil, though irregularly. In the early part of September, had an increase of his symptoms after exposure to the damp and cold. A week or two after left for Ireland, where he arrived safely, and was living at last accounts.

Case XII.—A servant girl, æt. 20, born in Ireland, rather above the medium height, with light brown hair, was admitted July 28th, 1849. This patient did not come under my notice until December 25th, five months after her admission. At that time she gave the following history of herself. Three years before, had hurt her side while lifting a heavy weight. Pain in her side had continued for a long time: was treated for liver complaint, but was not salivated. During this time was able to attend to her work, though feeling very weak and languid. Had had but little cough until April 1849. Attributed this to exposure to the damp and cold after sunset. During the month of May, frequently had chills followed by fever. No other member of her immediate family had had consumption, but two maternal aunts died of this disease. Had had several slight attacks of hæmoptysis.

She was admitted into the hospital merely as an act of charity, being thought too ill to send out of the house, but with little hope of surviving many weeks. Was at first ordered infus. prun. Virginian. Oj daily. Vallet's carbonate of iron, gr. v. ter die, and an anodyne. *Nov. 6th.* ℞. Ol. jecoris aselli, f ℥ss ter die. No. 4 diet and milk, &c. The following is a note of her condition in the latter part of December.

Amphoric respiration with metallic tinkling two inches below the left clavicle; very loud bronchial (almost cavernous) respiration below the right clavicle. Has hectic, exhausting night sweats, rigors, chronic laryngitis, with almost complete aphonia. Has recently had frequent attacks of diarrhœa, which are temporarily checked by acet. opii gtt. v. q.q. h. Is unpleasantly affected by sulphate of morphia, but not by black drop. Has frequent attacks of intense pain in the head, relieved by the application of a mixture of chloroform and camphor.

March 6th, 1850. Up to this date has taken cod-liver oil, though at first with much difficulty, using at that time the dark-coloured oil. I am assured by the gentlemen under whose care she has been, that although there has been little or no marked improvement in the local disease, yet that the disease has made little or no progress since her admission, and they are decided in the belief that this may be safely attributed to the use of the oil.

April 5th. Pulse very feeble; complains of pains in her chest and abdomen. Sputa nummular as before, but somewhat bloody. Bowels moved four times in the last twenty-four hours. *24th.* Great dyspnœa and diarrhœa. To correct this last, astringents and anodyne enemata have been used in vain. *26th.* Great dyspnœa and universal malaise. Continued to grow feebler and died, May 3d, 1850. Permission for an autopsy was positively refused.

Case XIII.—A servant girl, æt. 15, born in Ireland, short stature, with dark hair and eyes, had been four years in this country, was admitted November 9th, 1849. Had been ill for eighteen months. First had intermittent fever (?) (living in a malarious district), which continued for five weeks and was followed by cough and hæmoptysis. After this had a greenish-yellow expectoration, and lost flesh rapidly. Her mother is said to have consumption; her paternal grandmother died of this disease. [The note of the physical signs at the time of her entrance has been mislaid; they were those which positively indicated the existence of a tubercular cavity at the summit of the right lung.]

Was at once placed on the use of cod-liver oil in the usual dose. At first took the dark-coloured oil, subsequently the pale oil. At first took it alone, but became nauseated; took it without difficulty in the foam of porter. The patient used the oil for about four weeks before any improvement could be perceived. About a week later, had less pain in her side and less dyspnœa, and thought herself a little stronger than before. In two months time found that she was growing fatter. She continued steadily to improve until her dismissal, and was discharged at her own request, January 22d, 1850, being at that time of full face, as strong as she ever had been, having no cough or expectoration, bowels regular, and able to attend to her usual work, the physical signs being cavernous respiration and a peculiar *clicking* sound at the summit of the right lung. In reply to a question on the subject, she states she could not perceive that the oil had any effect on her bowels. She also states that she could take the medicine more readily immediately before meals than at any other time.

August 31st. The patient called here to-day. Is in very much the condition that she was when she left here. Has continued to take the oil as directed.

Case XIV.—A servant girl, æt. 18, born in United States, of scrofulous appearance, with light hair and of medium height, was admitted December 11th, 1849. Gives the following account of herself. Had had sore eyes (scrofulous ophthalmia) for a long time; with this exception had been in pretty good health until four months before her admission. At that time had her feet wet, and took cold; this was followed by cough, which has continued to grow worse. Coughed until she vomited, after walking but a short distance. Had loss of appetite; two months after her cough commenced, began to spit freely of yellow matter. Had never had much pain in her chest; had had no hæmoptysis; bowels regular, but had not menstruated for nearly six months. Had rapidly lost flesh; had chills and fever (hectic) every day. Had shortness of breath, especially in the evening; and during the night exhausting sweats. Had been under no medical treatment. Both parents died of consumption.

At the time of her admission these symptoms just enumerated existed in their full force. The physical signs were, bronchial respiration below each clavicle, most marked on the left side; slight dulness on percussion, and subcrepitant râle at the summit of the left lung.

The patient was directed to take cod-liver oil f℥ii ter die (the dark oil), but was unable to retain it. It was omitted, and infus. prun. Virgin. f℥ii t. d. was substituted; was also ordered a cough mixture.

For six weeks these symptoms continued; at the end of this time she resumed the oil in the infusion of wild-cherry bark, but was unable to continue its use on account of its obstinately nauseating effect. It was again omitted. The light oil was then given in the foam of porter, but owing to her great aversion to it, the patient did not at first take more than a tablespoonful daily. A fortnight later she was able to take it in the usual dose. Its use was continued for two months before any positive benefit was perceived either by the patient or by her physicians. The first change noticed was the disappearance of hectic fever; gradually the cough diminished, an improvement of the appetite took place, and, she states, after three months time she found herself rapidly gaining flesh.

June 20th, 1850. She has taken her medicine regularly up to this date, and now requests to be discharged; says she feels perfectly well, has little or no cough, no night sweats, no expectoration, no thoracic pain, sleeps well, has good appetite, and is regular, both with her bowels and catamenia. So far as we can judge from the rational symptoms, this patient should be pronounced perfectly well; but the improvement in the physical signs is very far from coinciding with these, for we now have obscure dulness below the left clavicle, with rude respiration and subcrepitant râle. Loud bronchial respiration, amounting almost to cavernous, and very distinct subcrepitant râle at the summit of the left lung—showing in fact rather an increase of the local disease, while there has been so marked an improvement in the general health. She is anxious to return to her home, and is this day discharged.

Remarks.—If we look over these reports, we shall find that in Case I., of whose history it will be seen I have but imperfect notes, the result was what will frequently be found to occur, though to a greater extent than in this man, namely, an increase in weight and strength, while no change takes place in the local disease.

In Case II. the disease had so far advanced as to give us no hope for improvement, yet the progress of the disease appears to have been arrested for a time, though but for a time. This case as well as others confirmed an observation made to the writer by an eminent physician of Baltimore, that although up to a certain period the oil may prove beneficial, yet that there is a time in the advanced stages of the disease in which it ceases to have any appreciable effect whatever. In such cases we have temporarily omitted and then resumed its use. If this insensibility continue, it has been thought both unnecessary and injurious to urge its further use.

Case III. illustrates a fact of some importance, namely, that the oil in some instances may be given, even though diarrhœa exist; and that patients may fatten and gain strength under its use even with this additional drain on their constitution. This too was an instance of life prolonged apparently by the use of the remedy.

Case IV. is a most striking instance of the happy effects which sometimes result from the use of the oil. Cough, emaciation, debility, &c., all successively disappearing while using this medicine, and this medicine alone. With this man there was, too, a decided improvement of the local disease, as shown by the physical signs. Case V. is but an analogue of the second case reported. Case VI. is an instance of what has been alluded to, the very marked improvement in the general health and strength under circumstances the most unpromising. It is indeed difficult to imagine a more discouraging case than this presented at the time of admission; yet this patient's life was prolonged for nine months, and was lost at last by a disease to a certain extent connected with his tubercular diathesis, yet not properly by the pulmonary affection.

The results of the autopsy may perhaps call attention to a remark made by Dr. Williams on the increased size of the liver during the use of cod-liver oil. The following are the words alluded to: "I have in numerous instances remarked that the bulk of the liver (as determined by percussion) becomes augmented during its use, yet without tenderness, or any other sign of disease."* Now we find that during life this increased bulk was noticed and abundantly shown by the inspection. A single case proves but little, but taken in connection with other observations may perhaps lead to some conclusions on the subject of the mode in which cod-liver oil operates. It is well known to pathologists that an augmentation in the volume of this organ is one of the most frequent attendants of phthisis pulmonalis. Louis found it to occur in forty out of a hundred cases. Opportunities for making inspections of phthisical subjects are frequently afforded at the hospital, but in no instance which has come under the writer's notice has there been an increase so evident during life, or so marked on the post-mortem examination as this case presented.

In Case VII. there was little or no evidence of any good following the exhibition of the oil. The patient was very positive in an opposite belief, but this infatuation is by no means uncommon; certain it is that very rapid progress was made by the local disease notwithstanding that the oil was steadily taken.

In Case VIII., so far as the oil is concerned, little can be learned, as the patient took it but for a short time and irregularly, and at the same time was using active tonics. This was the only case in which the diarrhœa seemed increased by the use of the oil. It was however thought at the time that any liquid not positively astringent would by its bulk alone, in the man's condition, have produced a similar result. The results of the inspection have been given in full as a striking instance of almost universal tuberculosis, coinciding with the well-known fact that pneumonia *occurring in a tubercular diathesis* may frequently be followed by phthisis.

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* London Journal of Medicine, January 1849, p. 16.

The result in Case XI. was most gratifying. The age of the patient, the advanced stage of the disease, and the great size of the cavern, gave little hope of amelioration much less of recovery; yet under treatment the results mentioned in the report followed, and the man is at this time engaged at his daily labour. The disappearance of his dyspeptic symptoms while using cod-liver oil cannot, I think, authorize us to consider the oil an anti-dyspeptic any more than the return of the menses in Case XIV. would justify us in calling it an emmenagogue. To the improved general health and strength must each of these results be ascribed. Case X. is an instance in which the oil as well as the other remedies used proved utterly impotent. We would of course suspect that in those cases where the tubercular disease is so universal, the remedies used would be less beneficial than if the disease were limited to one organ. With him there certainly was no good derived from the use of cod-liver oil; nor was there on the other hand any increase of diarrhœa following its exhibition. Case XI. is another instance of the fattening and strengthening properties of the oil, and another instance of non-increase of diarrhœa from its use. Case XII. is imperfect from the absence of a post-mortem examination; in other respects it corresponds with the third case reported. Cases XIII. and XIV. are both instances of very happy effects following the use of the oil. Case XIV., too, shows the propriety of not laying aside the oil from any aversion, however decided, which the patient at first may have to it; it also encourages its protracted use, even though it may have been taken for a long time without any appreciable benefit.

The question now very naturally arises, Have the results of the cases under treatment in the hospital been such as to authorize the statement that cod-liver oil will cure pulmonary consumption? I regret to state they have not. Certainly the cases reported do not warrant an affirmative reply, and they, though but a part of those under care, faithfully indicate the average result. We certainly have had no case of pulmonary consumption, unequivocally marked, in which all the evidences of disease, as shown by the rational symptoms and *by the physical signs*, have disappeared. The nearest approach to this is Case IV. which is the patient referred to in the third edition of Dr. Gerhard's work on *Diseases of the Chest*, p. 238. Even here, although there appears to have been a very marked improvement in the physical signs, the evidences of local disease were not entirely removed, and the patient cannot be said to have been perfectly cured. On the other hand, it will be seen that in all the cases reported the disease was in an advanced stage. In six of the number, the physical signs were those of a cavity in each lung. In each of six others a cavity existed in one lung, while in the remaining two the disease had advanced to the stage of softening. Under ordinary treatment, little or no happy result could have been expected; yet we find that of this number in five the disease, though terminating fatally, appeared to be for a time arrested; and that there was in these a decided though temporary increase of strength. One patient left the hospital somewhat improved, and five were so much benefited as to be able to return to their former occupations, believing themselves to be well; and so far as the rational symptoms were concerned, really so; while but in two instances do we find an entire insusceptibility to any good influence of the remedy.

And here I cannot avoid the remark, now fortunately almost supererogatory, that a knowledge of physical diagnosis is of the utmost importance in all cases of thoracic disease. Without such knowledge, five cases above alluded to would have been pronounced entirely well. This too may lead us to suspect that, in some (of course, not nearly all) of the cases reported in the journals as complete recoveries, this test has been neglected.

We have used, in the hospital, two kinds of oil, the pale and the brown oil. My own impression is that of these two the genuine pale oil is preferable; not that it is more efficacious, but that it is equally so, while it is much less offensive than the brown oil. Certain it is that there are patients who can take the pale oil without difficulty whose stomachs have steadily rejected the darker kind. In all the cases here reported, the pale oil has been used during a greater part of the treatment. A distinction should be made between the pale oil as obtained in that state from the fresh liver of the fish and much of that sold in our markets as pale oil, which is really the brown oil decolourized. As will be seen hereafter, this latter is thought to have been injured by the process required to effect this change. If the vender of the pale oil can be depended upon, this should certainly be preferred; if not, it would be safest to purchase the dark oil, which, from its cheapness, offers no inducement for adulteration, and which is always the oil of genuine though of old and too often of putrid livers.

We have generally allowed our patients to choose their own vehicle and time for taking the oil, attention being given that the entire amount prescribed was each day taken. It has been generally taken in the foam of porter, though a few patients preferred to take it in milk; by the majority, it was taken immediately before meals, but by a few it was most easily taken an hour after meals.

Being desirous of obtaining some information on the mode of preparation of the oil used in this country, and to ascertain if it corresponded with that employed in Europe, the writer addressed a number of questions to a gentleman residing near Boston, who, for thirty years, has been largely engaged in the preparation and sale of cod-liver (or, as during a greater part of that time it has been known, of tanners') oil. The following passages are taken from the reply. These statements, which can be relied on, will be found to be very similar to those given by De Jongh in his treatise on cod-liver oil.

"In preparing cod-liver oil for medicinal purposes, the livers should be selected from healthy fish, and used immediately after the fish are caught. We use the water-bath, by having double kettles, holding from fifty to sixty gallons each. The livers should be washed clean, and put in the kettles whole, and heat applied. The oil thus obtained should be taken from the kettles in an hour, or an hour and a half, and strained through a fine cloth. Another filtering is needed after it has cooled off."

"The oil thus obtained is the pale oil; the heat used should not be above 180° (Fahrenheit)."

"The livers vary very much in quality at different seasons of the year. At this time (November 12th, 1850), they are very fat; one hundred pounds of livers will yield forty pounds of oil. They will yield about this proportion until January; after that, they will begin to grow poor, and will continue so until April or May, when they will yield scarcely any oil, though the fish seem at this time to be as thrifty as at any other season."

"The livers of the cod-fish require considerable sorting, as there is quite a number of diseased ones among them."

"In obtaining the dark-coloured oil, the livers are thrown into casks, holding from three to six barrels each, standing in the sun. By this exposure to sun and air, the red color is obtained. This oil is from one to three months in making."

"The dark-coloured oil *can be made light* by a process of bleaching with an alkali, which we consider destroys all the good properties of the oil."

"When the pale oil becomes of a certain age, say from six to twelve months old, the properties of the oil become so much impaired that sulphuric acid will not produce the pink or red colour in any way."

"In regard to the oils sold as cod-liver oil, I should judge, from the quantity of oil sold and for sale, that not more than one-quarter part is genuine cod-liver oil. Our best livers are obtained near Lynn, Mass."

"We consider the best method of testing the oil to be, to take a small vial half full of the oil, add say one-eighth part of nitric acid, shake it well together; if it turns a handsome orange colour, and remains so for thirty minutes or more, it is a test for *pure* oil; but, if it turns quite dark, it may be suspected that other oils are mixed with it."

The writer adds that he has known it to be used medicinally, by those engaged in its preparation, for nearly thirty years.

If I mistake not, it is highly important that the real value of this remedy should be soon determined. Exaggerated impressions of its worth have no doubt been made, to be followed by their necessary disappointments. All the results promised by some writers from it have certainly not followed its use in the hospital, nor in a large number of cases in private practice, which, through the kindness of his medical friends, the writer has had an opportunity of closely watching. On the other hand, we can positively say that most of our patients, while using the oil, have increased in flesh, in weight, and in strength; that with most of them there has been a diminution of cough and of expectoration; that with some of them hectic and rigors have entirely disappeared; and that there have been some so benefited as to be able to resume their former occupations. We can also understand that it may so strengthen the patient as to enable him to make use of those hygienic means which are so efficacious; that it may thus, perhaps, indirectly cure consumption. Again, in phthisis, as the local affection is but a part of the disease, if the general health continue to improve, we may hope the diathesis will be, in the course of time, thoroughly changed, and thus, perhaps, cod-liver oil may cure consumption. But these suppositions are merely such; the assertion of its good, but limited, effects are positive. The first may happen, the last have happened.

An objection has recently been made to the use of cod-liver oil that it produces pulmonary congestion and hemorrhage. This is a plausible suggestion; we have not found it to exist in practice. The only instance in which an attack of bleeding could be positively traced to the use of the oil was that of a patient admitted for hæmoptysis, who, after having been in the house for several weeks, with great improvement of his hemorrhagic symptoms, was placed on the use of the oil from some suspicious physical signs. Nausea and emesis were produced by the oil, and a hemorrhage followed the act of vomiting. This may suggest a caution under similar circumstances.

It will be seen that in no instance did any decided benefit arise from the oil until it had been used for at least four weeks; it is equally important to observe that to be of any permanent benefit its use must be persisted in for a long time, even after the most striking symptoms of the disease have in great measure disappeared; a fact of which we have always endeavoured to impress the importance on our patients at the time of their dismissal from the hospital.

Although then, in conclusion, our experience has not been quite so gratifying as has that of some others, yet the writer is fully prepared to say that he believes cod-liver oil to be by far the best remedy for phthisis pulmonalis of which we have at this time any knowledge; and that to neglect its use in cases of this disease, unless there be a strong contra-indication, is, under existing circumstances, both injudicious and culpable.

PENNSYLVANIA HOSPITAL, *November* 13, 1850.

ART. III.—*Extracts from the Records of the Boston Society for Medical Improvement.* By WM. W. MORLAND, M. D, Secretary.

July 22.—*Acute Laryngitis complicated with Inflammation of the submucous Cellular Tissue of the Trachea.* Dr. BUCKMINSTER BROWN reported the case.—The patient was a labouring man, forty-five years of age. Was called to him March 28th. On the Tuesday previous, he had been all day exposed to a heavy snow storm, while at work on one of the wharves. The snow penetrated between his coat collar and neck, so that the sides of his